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An experiment conducted in the department of economics at the University of Nebraska to determine whether the application of the principle of specialization and the division of labor to classroom teaching holds promise for helping to solve the teacher shortage problem. The essence of the experiment was to separate the instructional process into its component parts and to assign the different activities to different personnel. In the experimental section, each staff member would perform only one function. Instructional activities were divided three ways: (1) Lecturing, (2) written assignments and examination, and (3) private conferences with students if requested.

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UNIVERSITY OF NEBRASKA

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Research in Teaching the Principles of Economics[1]

A project supported by the Fund for the Advancement of Education

HE7389

FINAL REPORT

I Introductory

Specialization of instruction is not a new idea. Except in the one-room rural school where the teacher must instruct in all of the grades and in all of the subjects, specialization of instruction is taken for granted. Schools with sufficient enrollments have specialists in mathematics, in English, in music, etc. This is true on the elementary and secondary levels as well as on the collegiate level. The rapidly worsening teacher shortage demands that all possible avenues be explored for means of alleviating the problem. One avenue is the extension of the principle of specialization and the division of labor to classroom teaching.

During the past year, the department of economics at the University of Nebraska has sought to determine whether or not this avenue holds promise for helping to solve the teacher shortage problem. The experiment has been supported by the Fund for the Advancement of Education. The course selected for the experiment was the two-semester course in the principles of economics which hereinafter will be referred to as Economics 11 and Economics 12.

A number of factors contributed toward the development of the experiment which may be described as follows: 1) the increased difficulty that has been experienced during recent years in recruiting staff for the many sections of the principles course under a College imposed rule setting 35 students as the standard of class size; 2) the necessity for relying in part upon inexperienced graduate assistants who had to be selected, for the most part, without benefit of a personal interview; 3) the reported tendency of instructors to lecture almost exclusively rather than to conduct their classes upon a lecture-discussion basis; 4) the propensity of students to seek out certain instructors and to devote almost endless effort to securing a transfer of sections if assigned to another instructor; and 5) the reported tendency of some instructors to neglect written assignments through which students are compelled to come to grips with the concepts involved in the course, and to neglect periodic examinations which serve both as a spur to effort and as a gauge to achievement.

The essence of the experiment was to separate the instructional process into its component parts and to assign the different activities to different personnel. In the experimental section, each staff member would perform only one function. A three-way division of instructional activities was decided upon. The first activity was that of lecturing with the purpose of giving students a condensed outline of the subject

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rather [illegible] interesting and stimulating manner. The second was that of developing and administering a program of written assignments and examinations through which students would be compelled to make practical application of what they had learned from their reading assignments and from the lectures. The third consisted of assisting students who, under the traditional method of organization, require additional personal attention for any reason.

Regular members of the instructional staff of Economics 11 and 12 were designated to undertake the first two of the instructional activities. Proceeding upon the assumption that the lectures would be the most vital portion of the instructional process, those individuals were assigned to conduct the lectures who were believed by the department chairman to be the most effective lecturers. To assume responsibility for the written work program, a relatively inexperienced full-time instructor who was regarded by his colleagues as especially adept in this capacity was selected. Graduate assistants were used to conduct the private conferences under a schedule which gave each student at least one interview per week. These conferences were entirely optional. The lecture sections met three times weekly while written work was assigned on the average about once every two weeks.

Each lecturer conducted only one experimental section and no non-experimental section. He was given credit equivalent to that of an instructor teaching two nonexperimental class sections. The remainder of the lecturer's teaching program was made up of courses other than the principles of economics. The lecturer was provided with a graduate assistant in the preparation of materials and was encouraged to utilize audio-visual aids to the maximum. Although the experimental sections had been planned to include about 250 students each, during the first semester the Economics 11 section started out with about 220 students and the Economics 12 section with about 110. During the second semester, each experimental section started with about 175 students. The number who took the attitude test at the close of the second semester was 156 in Economics 11 and 138 in Economics 12. A few students in each course, due to conflicts in the examination schedule, were unable to take their examinations at the regularly scheduled period and therefore did not take the attitude test.

Four small sections of about 35 students each were provided in Economics 11 during each semester for control purposes. In Economics 12 there was only one control section during the first semester and four during the second semester. The instructors in these sections, on the average, had at least as many years of experience in teaching the principles course as the lecturers in the experimental sections. Since it was impossible to manage the distribution of students into experimental and nonexperimental sections so as to assure uniformity in background, etc., a careful survey was made of the characteristics of the students in each of the class sections. An analysis was made to determine the influence, if any, of such factors as student aptitude, college of matriculation, and the extent of the student's progress as measured by cumulative credit hours.

To test the actual results of the experiment, a comparison was made of student achievement as measured by common monthly and final examinations. A survey also was made of student attitudes at the close

of the semester. This latter operation presented a delicate problem. The staff members participating in the project reflected the usual sensitivity concerning student attitude surveys and were fearful of the significance that might be attached to the results. The common monthly examinations were abandoned because of the adverse effects they had upon the morale of students and instructional staff.

Two criticisms have been directed against the experiment by students and staff members. It has been suggested that the experiment was unsound because the experimental and nonexperimental sections were conducted by different individuals. This criticism reveals a misconception of the objective of the experiment. The project was not designed to test the relative merits of the large vs. the small section but rather to determine the feasibility of extending the principle of specialization and division of labor to the teaching process. There is implied also the suggestion that the personnel selected to conduct the experimental sections represented the superior teachers. It does not follow that because an instructor is especially adept at lecturing he is therefore a superior teacher. Outstanding teachers are frequently poor lecturers. Moreover, the written work program and the counselling services were in charge of personnel with very little or no previous teaching experience.

The second criticism has been that students in the experimental sections were being favored by being assigned the "best" instructor and by being given well designed written exercises. This criticism overlooks the fact that when all class sections are limited to 35 students each, only a small fraction of the students may be assigned to the "best" instructor. If it develops that a department has a superior teacher who is a capable lecturer, the method of instruction under investigation is one way to give each student the benefit of his services. As to the written exercises, the criticism again reveals a misconception concerning the nature of the experiment. One of the primary features was to provide a well designed written work program. There was no restriction imposed upon instructors which would prevent them from designing even better exercises. It was provided only that they might not use the exercises which had been designed for the experimental sections. During the second semester, even this restriction was lifted so that each instructor was free to use these exercises as he saw fit.

II Student Achievement

A comparison of the achievement of students in the experimental and nonexperimental sections of Economics 11 and Economics 12 does not tell a uniform story. The average score on the final examinations made by students in the experimental section of Economics 11 was higher than that of the students in the nonexperimental sections in both semesters. In the first semester, the average final examination scores in Economics 11 were 73 and 70, respectively. In the second semester, the averages were 74 and 67, respectively. These are substantial differences.

In contrast to the situation in Economics 11, the nonexperimental sections in Economics 12 scored higher on the average in each semester than the experimental sections. In the first semester, the difference in average scores was only one-half percentage point. However, in the second semester, the difference increased to five percentage points. This also is a substantial difference.

In searching for an explanation for these differences in the level of student achievement, it has been possible to eliminate several potential causes. One of these is the examinations. In the first semester, the final examination in both Economics 11 and 12 was constructed by the instructional staff of the principles course. Each instructor submitted questions for consideration. Unless a question secured the approval of each instructor, it was rejected. The examination contained both objective and essay questions. The objective questions were machine scored while the essay questions were read by student readers. Each student's solution to a given question was read by the same reader applying standards agreed upon by the instructors concerned. The readers did not know the section designation of the student whose paper was being read. A similar procedure was followed in constructing and scoring the monthly unit examinations. A high correlation was found between the scores of the final examinations and the monthly unit examinstions.

In the second semester, a somewhat different procedure was adopted. The course instructors submitted a list of topics covered in the course. Upon the basis of this list, a staff member who was not currently engaged in teaching the principles course designed a purely objective examination. After the last class meeting of the semester, each instructor was asked to score the proposed examination. The results were compared and each question upon which there was less than complete agreement was eliminated. The resulting examination consisted of 100 objective questions concerning the solutions of which the instructors were in complete agreement. There was no opportunity for instructors to "prepare" their students for the examination. The examination was machine graded.

The differences in student achievement are not traceable to differences in the quality of student. Using the cumulative grade average as the measure of student quality, a comparison was made for the first semester of cumulative grade averages and the scores received on the final examination. A positive correlation was found to exist. Students in the experimental and nonexperimental groups were then distributed on the basis of cumulative grade average and the percentage of total enrollment included in each classification was computed. The results of this analysis are shown in Table 1. A study of the cumulative percentages in Table 1 as the size of the segment of the class which included the best students is increased shows that the quality of students in the nonexperimental section of Economics 11 was somewhat superior to that of the experimental section. Yet the experimental section averaged 3 percentage points higher than the nonexperimental section.

The quality of the students in the nonexperimental section of Economics 12 also was somewhat better than that of the experimental section. Yet in this case the average final examination scores were almost identical.

For the second semester, a different sort of analysis was made. The students were classified according to aptitude score. This time a comparison was made of the average final examination scores of the students in the experimental and nonexperimental sections for each bracket. The results of this analysis are shown in Table 3 of the Appendix. A study of Table 3 shows that there is a tendency for the average examination score to increase as student aptitude increases. This observation

Table 1: Percentage distribution of students according to aptitude scores, 2nd semester.

Range of aptitude scores	Percentage distribution				Cumulative percentages			
	Economics 11		Economics 12		Economics 11		Economics 12	
	Experimental	Nonexperimental	Experimental	Nonexperimental	Experimental	Nonexperimental	Experimental	Nonexperimental
159-178	3.9	5.5	.6	2.0	3.9	5.5	.6	2.0
140-158	12.4	17.1	13.5	16.7	16.3	22.6	14.1	18.7
121-139	35.9	29.3	39.4	32.4	52.2	51.9	53.5	51.1
102-120	32.7	28.0	29.0	34.3	84.9	79.9	82.5	85.4
83-101	10.5	14.0	14.8	10.8	95.4	93.9	97.3	96.2
64-82	4.6	4.9	2.7	2.9	100.0	98.8	100.0	99.1
45-63		.6			100.0	99.4	100.0	99.1
26-44		.6		.9	100.0	100.0	100.0	100.0

Data secured from aptitude tests administered at the beginning of the course.

Table 2: Distribution of students by college of matriculation; 1st semester.

College of matriculation	Economics 11				Economics 12			
	Experimental		Nonexperimental		Experimental		Nonexperimental	
	1st Sem.	2nd Sem.	1st Sem.	2nd Sem.	1st Sem.	2nd Sem.	1st Sem.	2nd Sem.
Business	61	43	31	25	73	75	48	56
Engineering	24	34	30	41	4	11	14	15
Arts & Science	5	8	8	9	5	5	5	11
Teachers	2	6	9	6	5	5	16	4
Agriculture*	2	5	7	15	3	1	11	14
All others	5	4	15	4	10	3	7	0

*Does not include classes offered on College of Agriculture campus during the first semester.

Table 3: Percentage distribution of students according to cumulative credit hours; 2nd semester.

Cumulative credit hours	Percentage distribution				Cumulative percentages			
	Economics 11		Economics 12		Economics 11		Economics 12	
	Experimental	Nonexperimental	Experimental	Nonexperimental	Experimental	Nonexperimental	Experimental	Nonexperimental
Under 20	12.6	3.3	.7	0.0	12.6	3.3	.7	0.0
20 - 29	7.5	3.3	1.3	1.0	20.1	6.6	2.0	1.0
30 - 39	16.3	13.1	6.7	2.9	36.4	19.7	8.7	3.9
40 - 49	36.3	34.6	45.0	33.0	72.7	54.3	53.7	36.9
50 - 59	8.1	9.8	16.8	19.4	80.8	64.1	70.5	56.3
60 - 69	2.2	7.2	7.4	9.7	83.0	71.3	77.9	66.0
70 - 79	8.1	13.7	14.8	14.6	91.1	85.0	92.7	80.6
80 - 89	5.9	7.2	4.0	11.7	97.0	92.2	96.7	92.3
90 - 99	1.5	1.3	.7	1.0	98.5	93.5	97.4	93.3
100 - 109		2.6	1.3	1.9	98.5	96.1	98.7	95.2
Over 109	1.5	3.9	1.3	4.8	100.0	100.0	100.0	100.0

Data on cumulative credit hours were taken from official University student records.

is in accord with the relationship reported in the Preliminary Report. (See Preliminary Report, page A-2)

There is no clear indication that either the experimental or the nonexperimental group was superior to the other group from the standpoint of student ability as reflected by aptitude scores. This conclusion is based upon the following analysis in which the students in each group during the second semester were classified according to aptitude score and shown as a percentage of the total group enrollment. A comparison of the cumulative percentages at any given range of aptitude scores, in most instances, shows very small differences.

College affiliation is a variable which seemed to be related to levels of student achievement. An analysis of the composition of the various groups showed a considerable variation in the percentages of total enrollment that students from the various colleges represented. Such an analysis for the first semester is present in Table 2.

Not all students do equally well in the principles of economics course. Whether this is due to differences in student interest or some other factors is immaterial for purposes of this analysis. However, the average score attained by students from the various colleges covered a wide range.

The average scores attained by students from the various colleges are shown by semesters in the following tabulation:

	First semester	Second semester
Business administration....	77	72
Engineering.....	76	72
Arts and science.....	71	75
Teachers.....	68	71
Junior division.....	66	64
Agriculture.....	65	62

It was necessary to exclude the classes at the College of Agriculture from the experiment during the first semester because the size of class and the conditions under which the course was offered prevented the classes from qualifying either as experimental or nonexperimental sections. If a similar procedure is followed for the second semester, the margin of superiority of the experimental over the nonexperimental sections of Economics 11 is reduced from 7 to 4 points. While some of the other differences in college representation are quite substantial, it does not seem that they are likely to have affected the group examination grade averages significantly.

Not all students take the principles course at the same stage of their collegiate progress. In the College of Business Administration, a student normally takes the course in the Sophomore year. It is practically necessary to do so since this course is a prequisite for nearly all Junior level courses in business and economics. Many students, however, defer Economics 12 until later in their college career. Engineering students, because of a relatively "tight" program of required courses, frequently wish to take Economics 11 as second-semester Freshmen in order that they may be qualified for certain advanced courses in business and economics. They may be permitted to do this if their grade averages are sufficiently high. Students transferring to the

College frequently have not had an acceptable principles course and may be required to take Economics 11 and 12. As a result, the enrollments in Economics 11 and 12 are usually composed of students of widely varying cumulative credit hours. To what extent may variations in this factor affect average examination scores?

A comparison of the examination scores in the experimental and nonexperimental sections for students representing various stages of progress toward the bachelor's degree shows that there is some tendency for the average final examination scores to increase as the cumulative credit hours increase. See Table 4 of the Appendix, page A-11.

An analysis of the composition of the groups during the first semester is presented in Table 3.

This analysis shows that both of the nonexperimental sections were favored from the standpoint of the maturity of the student as measured by cumulative credit hours. This is true because the cumulative percentages for both experimental sections run consistently and substantially above those of the nonexperimental sections as the cumulative credit hours increase.

A study of the examination scores of students who devoted time to outside employment and to extra-curricular activities did not provide the basis for any important generalizations. Students devoting a moderate amount of time to such activities frequently scored higher than students who had no outside work or extra-curricular activities. Students who devoted a great deal of time to these pursuits sometimes made very high scores while others made very low scores. It was not apparent that the various groups differed significantly in the extent to which the members were engaged in outside employment or extra-curricular activities. It is concluded therefore that variations in the amount of time devoted to outside employment and extra-curricular activities does not account materially for differences in achievement between experimental and nonexperimental sections.

It was found that students whose major interest in high school was in college preparatory, foreign languages, mathematics or accounting averaged substantially higher than those whose interests were in agricultural, commercial, industrial or fine arts. Students whose interests were primarily in history, science, or English averaged roughly 5 percentage points above the latter group and 5 percentage points below the former. It is believed, however, that students in college tend to pursue the interests which they have developed in high school so that whatever influence this factor may have had on average grades already has been taken into account when the factor of college affiliation has been considered.

The conditions under which students study frequently influence their achievement. For example, during the first semester, students residing in the University dormitories averaged 5 percentage points higher in their principles of economics courses than students living in fraternity or sorority houses. Students maintaining their own homes averaged 4 percentage points higher than the fraternity or sorority residents. The distribution of students by type of housing therefore may be a matter of some importance in explaining examinatior grade differentials.

Such a distribution for the first semester shows that in Economics 11 students residing in University dormitories and those maintaining their own homes constituted 35 percent of the total enrollment in the experimental section and 38 percent in the nonexperimental sections. Those living in fraternity or sorority houses, those living at home or with relatives, and those occupying rooms or apartments in private homes made up approximately the same percentage of the experimental and nonexperimental groups in Economics 11. This factor therefore was not important in explaining examination differentials in Economics 11.

In Economics 12, on the other hand, students maintaining their own homes and those living in University dormitories made up 39 percent of the experimental group but only 29 percent of the nonexperimental group. Students living in fraternity or sorority houses made up 22 percent of the experimental and 36 percent of the nonexperimental sections. Since each of these differences operated to the advantage of the experimental section, it may be concluded that housing conditions were a positive factor in creating examination grade differentials to the advantage of the experimental section in Economics 12.

It was assumed that the nature of a student's past experience affects his ability to grasp difficult economic concepts and relationships. Therefore it was considered advisable to study family backgrounds of the students in the course to determine whether or not differences therein might have contributed to the differences in achievement between the experimental and nonexperimental groups. A comparison of the average examination scores at the end of the first semester of students classified according to parental occupation showed that the average scores supported a threefold classification of the students. Students from families engaged in manufacturing, management, or transportation achieved an average examination score of 74 percent. Those whose families were merchants, laborers, farmers, bankers, or professional people made averages of either 70 or 71 percent. Finally, those from families of journalists, clerks, government workers or writers averaged only about 68 percent. It should be emphasized that the number of cases for many of the above occupational groups did not constitute adequate statistical samples.

A percentage distribution of students in the principles course during the first semester on the above basis disclosed that from 73 to 82 percent of the two experimental and the two nonexperimental groups were composed of students whose families were farmers, laborers, merchants, bankers, or professional people. It seems unlikely therefore that this factor exercised any appreciable influence upon the level of achievement in either the experimental or nonexperimental groups.

Examination scores may be influenced by a student's reason for taking a course. Investigation disclosed that, during the first semester, students in the principles course who were there to meet specific requirements or to fulfill a prerequisite averaged roughly 5 percentage points less on their final examinations than students who were taking the course from choice. In Economics 12 there was a considerable uniformity between the experimental and the nonexperimental sections in the percentage of students who were taking the course for each of the specified reasons. But in Economics 11, almost 38 percent of the students in the nonexperimental and 28 percent of those in the experimental

section were taking the course to meet specific requirements or to fulfill a prerequisite. This difference may have given the experimental section in Economics 11 a slight advantage.

It would be desirable to know whether or not specialized instruction is effective in preparing students for subsequent work in economics. For this reason a study was made of the experience of students in Economics 12 during the second semester. These students fall roughly into three major categories: 1) those who were under the same type of instruction during both semesters, 2) those who were under a different type of instruction each semester, and 3) those who did not take their Economics 11 at this institution during the first semester of this academic year. The results of this analysis are summarized in the following tabulation:

	Number of students	Percent of total	Average Score
Nonexperimental section students:			
Previously in nonexperimental section..	50	46	72
Previously in experimental section.....	38	35	76
Not in Economics 11, first semester....	21	19	71
Experimental section students:			
Previously in experimental section.....	91	58	67
Previously in nonexperimental section..	39	25	69
Not in Economics 11, first semester....	28	17	69

It would seem, on the basis of the above results, that the experimental section provided superior training for students who were to continue their work in the lecture-discussion section. Although the grade differential is very small and probably does not warrant a generalization, it appears that for students taking Economics 12 under specialized instruction the better training would be secured in the lecture-discussion type of class organization.

From the evidence which has been presented in this section, it seems apparent that although it was not possible to assign students to the experimental and nonexperimental sections upon a scientific basis, the resulting differences in class composition do not adequately explain the examination grade differentials that were found to exist. Evidently the method of instruction was a significant factor.

III Student Attitudes

Some of the results of the attitude survey administered at the close of the first semester were reviewed in the Preliminary Report submitted in June. One of the features of that survey was a section in which students were asked to complete each of the three following sentences: 1) From my point of view, the best thing about this course was _____, 2) From my point of view, the worst thing about this course was _____, 3) If I were recommending changes to be made in how this course is to be taught in the future, I would recommend that _____. A great variety of comments were made, some recurring quite frequently, from which it was possible to formulate tentative judgments concerning the relative merits of the method of instruction being investigated.

In constructing the attitude survey for the second semester, those statements among the 20 used in the first semester which proved ambiguous or otherwise unsatisfactory were rejected and new statements, based primarily upon the responses to the three statements set forth above, were added. The second semester's attitude survey contained 33 statements of which only 11 were repeated from the first survey. The statements were grouped under the following headings: 1) General Impressions, 2) Examinations, 3) Organization, 4) Instruction, and 5) Content of course. It was believed that this grouping assure students considering the statements from a common point of view.

Although the first semester's attitude survey was administered by the department of educational psychology, this survey was administered by the economics department. Every effort was made to assure the students that these questionnaires would not be available to their instructors or to anyone participating in teaching the course. In this way it was possible to induce each student to sign his name to the questionnaire so that this information could be accumulated with other data concerning that student. It is believed that almost without exception students expressed their honest convictions.

With respect to each of the 33 statements in the questionnaire, students were asked to encircle the symbol which most nearly described their attitude concerning that statement. There were five choices as follows: SA = strongly agree; A = agree, but not strongly so; U = undecided or neutral; D = disagree, but not strongly so; SD = strongly disagree.

A summary of the reactions of the students in each experimental and nonexperimental group to each of the 33 statements is presented in the Appendix to this report, pages A-1 to A-8 inclusive. Since the groups varied in number of students, the responses are presented as percentages of students in the group concerned in order to facilitate comparison. For questions that are repetitions from the first semester, the results are given for each semester separately so that it is possible to observe what changes, if any, have occurred in student attitudes.

An examination of these results shows that the experimental section of Economics 11 was very well received by the students. While a large percentage of students felt that the class was too large, that they did not have adequate opportunity to discuss in class, and that there was inadequate opportunity to discuss examinations with the instructor, it is to be noted that the experimental section received a superior rating in the ability of the instructor to stimulate student interest, to demonstrate a genuine interest in students, to pitch the discussion to the level of the students, and to create a desire on the part of students to take additional courses in economics. It is probably significant that, when the students in spring registered for fall classes, the maximum capacity of registrations was reached first in the large lecture section that is to be conducted upon the basis of specialized instruction.

Student reactions in Economics 12 upon the vast majority of items was substantially the same for experimental and nonexperimental sections. However, because of the strongly unfavorable reaction to class size, to the absence of class discussion, and to the inability to discuss examinations with the instructor, the overall attitude was some-

what more favorable to the nonexperimental than to the experimental sections.

There are several factors which probably contributed significantly to the relatively poor showing of the experimental section in Economics 12. During the first semester, it was impossible to obtain the lecture hall that had been counted upon. The only room available was one in which the width was greater than the depth, making it virtually impossible for students in the front of the room at either side to have a good view of the materials projected upon the screen. Moreover, the first semester is the odd semester for Economics 12, i. e., the number of students enrolled in the course is much smaller than the number enrolled in the second semester. Because of the limited size of the room, it was necessary to restrict the enrollment in the experimental section to 110 - a figure much below original anticipations. Another difficulty that had not been anticipated was that the instructor selected to lecture in Economics 12 was actively engaged in supervising several M. A. and Ph. D. candidates in the preparation of their theses. The demands of these students frequently interfered with the instructor's preparation of lectures. As a result of these conditions, the instructor felt it necessary from time to time to abandon the lecture method in favor of class discussion for which the size of class was not well adapted.

It was necessary to change instructors for the second semester in the experimental section of Economics 12. The individual selected was believed to have all of the qualifications of a good lecturer except that he had a limited experience in teaching the principles course. It seems more than likely that it was this lack of previous experience which was primarily responsible for the failure of the experimental section to receive a better student reaction during the second semester. On the other hand, many of the staff members express the view that the materials covered in Economics 12, consisting largely of economic analysis, are much more difficult to teach than the more descriptive materials of Economics 11. It is not altogether clear why this difference in the nature of the materials should operate in favor of the traditional lecture-discussion method of teaching. This is a problem that requires further study and experimentation.

Student attitudes apparently were not materially affected by such considerations as student aptitude, student progress toward the bachelor's degree, or by collegiate affiliation. This is shown in Tables 3, 4 and 5 presented in the Appendix, pages A-10 to A-12 inclusive. Many students seem to prefer the small lecture-discussion type of class organization to which they long have been accustomed. On the other hand, they do appreciate the by-products of specialized instruction such as orderly presentation, clear demonstrations, and well chosen practical applications of the principles being studied.

A special feature of the second semester's survey consisted of a list of topics for Economics 11 and Economics 12, respectively, accompanied by a request that the student "indicate in each case by an X your own estimate of your understanding of the fundamental notion involved." Two columns were provided - one headed Clear, the other Confusing - for the students to place their marks. This information was intended both to reveal student attitudes and to aid the instructors in

the future to apportion their time properly among the various topics. The results of this portion of the attitude survey are presented in the Appendix, Table 2, page A-9.

In Economics 11 there were 13 topics, out of a total of 17, in which a greater percentage of the experimental section than of the non-experimental sections indicated that they had a clear understanding of the topic. However, in only two of the cases was the difference great enough to be considered statistically significant.[1] On the four topics on which the nonexperimental group showed a greater percentage of the class indicating that they had a clear understanding of the topic than was true of the experimental section, the difference was found to be statistically significant in the case of only one.

In Economics 12 there were 15 topics, out of a total of 26, in which a greater percentage of the experimental section than of the non-experimental sections indicated that they had a clear understanding of the topic. The experimental section left a greater percentage of its students "confused" in 10 of the 26 items. The differences in only 7 items were great enough to be considered statistically significant.[2]

Although students are sometimes mistaken about how well they understand the various topics, it is important to student morale to have a majority of the students feel relatively confident concerning most of the important topics. From this standpoint, the experimental sections in both Economics 11 and Economics 12 measured up very well.

IV Conclusions

A statement of tentative conclusions was presented in the Preliminary Report. See pages 6 to 8. Since further analysis of the data supplied by the investigation confirms these conclusions, it seems unnecessary that they be elaborated upon here.

To summarize briefly, it may be said that specialized instruction as practiced in this experiment has the following merits:

1. It permits improvement in the quality of instruction in the principles of economics.

2. It is acceptable to the great majority of students.

3. It maximizes the opportunity of students to receive instruction from competent and experienced instructors.

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[1] On "organization and structure of organized labor" the nonexperimental section indicated that they had a significant superiority in understanding. On "national income, equilibrium level," the experimental section showed a significant superiority.

[2] The experimental section showed superiority with respect to the following four items: "short-run" concept; "implicit and explicit returns" concept; "foreign exchange rates"; and "balance of international payments". The nonexperimental section showed a significant superiority with respect to 3 items: "derived demand" concept; "equalizing differences in wages"; and "economic consequences of high tariffs".

4. It relieves the teaching staff of many routine tasks and enables them to concentrate their efforts upon the activities for which they are best qualified.

5. It provides a means for improving the selection and training of graduate assistants who wish to become college teachers.

6. It is feasible wherever the following conditions prevail:

a) At least 150 students are available at a single hour for the requisite number of days per week for the lecture period.
b) A room is available at the above hour that is suitable for the use of audio-visual aids.
c) An instructor is available who knows his subject thoroughly and has demonstrated an ability to present it in an interesting and stimulating manner.
d) An instructor is available who is adept at designing and administering a program of written work.
e) There is an adequate supply of senior or graduate students who have had some advanced training in economics and who are competent to function in a tutorial capacity.
f) The school administrative officials are cooperative and appreciative of the extensive planning that must go into this method of instruction.

Following is a comparison of student reactions to each of the statements contained in the attitude survey administered at the close of the second semester. The number of students participating in the survey, 591. These were distributed among four groups as follows: Economics 11 nonexperimental, 167; Economics 11 experimental, 156; Economics 12 nonexperimental, 110; Economics 12 experimental, 158. The number of students reacting in a particular manner with respect to any given statement is shown as a percentage of that group. The symbols used to head up the columns and their meanings are as follows:

SA = strongly agree
A = agree, but not strongly so
U = undecided, or neutral
D = disagree, but not strongly so
SD = strongly disagree

The group of numerical columns at the left in each case refers to Economics 11 and the group at the right to Economics 12.

		Economics 11					Economics 12				
		SA	A	U	D	SD	SA	A	U	D	SD
Statements reflecting general impressions:											
1. This course has been a satisfying experience for me.											
Nonexperimental	First semester	11	45	17	20	6	2	44	20	24	10
	Second semester	19	49	13	16	4	7	43	25	16	9
Experimental	First semester	28	47	17	8	1	8	38	19	21	14
	Second semester	29	52	10	8	1	11	46	20	18	5

Student reaction indicates except for the nonexperimental sections of Economics 12, that over one-half of the students considered the course a satisfying experience. The experimental sections in both courses rated higher in this respect than the nonexperimental groups. It may be noted also that Economics 11 rated better than Economics 12 both in the experimental and the nonexperimental groups.

2. On the basis of my experience in this course, I would recommend it to other students.											
Nonexperimental	First semester	14	34	29	17	6	2	40	27	27	5
	Second semester	16	47	24	8	5	10	46	22	18	5
Experimental	First semester	25	42	20	7	7	10	18	24	28	20
	Second semester	31	43	14	10	3	11	46	22	17	4

Less than one-half of the students in the nonexperimental sections of either Economics 11 or Economics 12, on the basis of their experience during the first semester, were willing to recommend the course to others. This was true also of the experimental section of Economics 12, but over two-thirds of the experimental section of Economics 11 were sufficiently enthusiastic about the course to recommend it to others. On the basis of their experience during the second semester, all groups expressed a willingness to recommend the course to others. The enthusiasm was greater in Economics 11 than in Economics 12 and the experimental section of Economics 11 retained some superiority on this point.

3. I had difficulty grasping the important concepts in this course.											
Nonexperimental	First semester	11	34	11	37	7	5	44	13	32	7
	Second semester	20	27	9	31	13	13	32	15	38	3
Experimental	First semester	7	24	18	33	18	25	37	14	19	5
	Second semester	10	22	13	38	17	12	29	11	36	11

Since students vary in their abilities and interests, student reaction to the statement should be more or less evenly spread over the entire scale. Such is the case. Nevertheless, there are important differences that seem significant. One of these is that the greatest change to occur from the first to the second semester involved the experimental section of Economics 12. The percentage indicating that they had difficulty in grasping the important concepts declined from 62 to 41 per cent. It is apparent also that a substantially smaller percentage of students experienced difficulty in the experimental section of Economics 11 than in the nonexperimental section.

4. As a result of this course, I would like to take more economics whether or not such courses are required.

Nonexperimental	First Semester	10	22	24	29	15	5	27	34	17	17
	Second Semester	10	22	26	24	18	5	25	32	27	12
Experimental	First Semester	17	31	34	8	11	4	22	25	29	20
	Second Semester	15	28	26	21	10	10	24	29	25	12

The percentage of students reacting favorably to this statement in the nonexperimental sections of Economics 11 and Economics 12 was almost identical for the two semesters. The percentage reacting unfavorably was somewhat greater in the Economics 11 nonexperimental sections. Students in the experimental section of Economics 12 reacted slightly less favorably and those in the experimental section of Economics 11 slightly more favorably than those in the nonexperimental sections. There was some improvement in the Economics 12 section in the second semester.

5. This course should be required of all college students.

Nonexperimental	First Semester	15	34	22	17	13	10	24	27	17	19
	Second Semester	20	30	22	15	8	10	31	19	22	18
Experimental	First Semester	23	32	30	9	7	13	24	27	29	10
	Second Semester	25	30	18	17	10	10	27	28	19	16

Forty-nine per cent or more of the students in Economics 11 during each semester indicated approval of the statement that the course should be required of all college students. The percentage in support of the proposition was somewhat greater in the experimental than in the nonexperimental sections. Less than 40 per cent of the students in Economics 12 reacted favorably with the experimental section rating somewhat more favorably than the nonexperimental. The less favorable showing for the Economics 12 sections may be due to the difference in course content.

Statements relating to the examinations in the course:

6. The examinations in the course covered what was actually taught.

Nonexperimental	Second Semester	36	41	4	11	8	25	38	13	23	2
Experimental	Second Semester	38	45	4	8	4	22	51	7	15	5

Student reaction indicates that a large majority of the students in all four groups were satisfied that the examinations covered what was actually taught. Since this issue was not raised in the first semester's attitude test, it is impossible to determine whether the situation had changed since the first semester. It should be noted that each of the experimental sections scored somewhat higher than its nonexperimental counterpart.

7. There were too few examinations.

Nonexperimental	Second Semester	11	23	22	30	14	7	18	25	39	11
Experimental	Second Semester	1	9	23	46	21	5	12	20	41	22

The vast majority of students in each of the four groups indicated disapproval of having more examinations. However, of those agreeing that there had been too few examinations, the largest percentage was found in the nonexperimental sections.

8. Essay examinations should have been used more.

Nonexperimental	Second Semester	11	22	22	29	16		6	13	23	36	22
Experimental	Second Semester	3	9	12	13	33		5	12	18	37	28

Student reaction against the increased use of essay type examinations was quite pronounced in each of the groups. It was more pronounced in the experimental than in the nonexperimental sections. There is a tendency among instructors of large classes to depend more upon objective type examinations. Perhaps the above results show that the students in the experimental sections have been well pleased with their examinations.

9. There were too many examinations.

Nonexperimental	Second Semester	1	5	16	40	38		1	4	19	46	30
Experimental	Second Semester	1	6	21	46	27		0	3	22	49	26

Student reaction to this statement bears a striking resemblance to the reaction to statement number 7, its exact converse. There is no noticeable difference between the experimental and nonexperimental sections. Apparently the vast majority of students in all groups were satisfied with the number of examinations given or did not feel competent to take a positive stand.

10. Objective examinations should have been used more.

Nonexperimental	Second Semester	15	25	23	24	12		10	35	30	15	9
Experimental	Second Semester	10	35	32	17	6		10	26	27	22	15

The ratio of those approving this statement to those disapproving it was almost 2 to 1 in the experimental section of Economics 11 and the nonexperimental sections of Economics 12. In the other two groups there was an approximately equal division between the supporters and the dissenters. It is impossible therefore to draw any valid conclusions concerning the influence of specialized instruction upon the type of examination preferred by students.

Statements relating to the organization of the course.

11. My class was too large.

Nonexperimental	First Semester	2	2	12	41	43		2	7	12	46	32
	Second Semester	4	9	7	38	42		4	7	4	45	41
Experimental	First Semester	29	18	15	24	14		54	20	8	9	10
	Second Semester	27	20	12	28	13		28	19	15	27	11

Student reaction to the above statement shows clearly that, other things equal, students prefer small sections to large ones. In fact roughly 10 per cent of the students in the nonexperimental sections of about 35 students each indicated that their class was too large. On the other hand, during the second semester in the two experimental sections, the percentage of students who indicated that the class was too large was approximately equal to the percentage of those who felt that it was not too large. Many students apparently recognized that size of class is only one factor contributing to the quality of a classroom situation.

Student reaction in the experimental section of Economics 11, where there had been a change in classroom and a reduction in size of class from about 225 to 175 but no change in instructor, was almost the same in the two semesters. But in Economics 12, where there had been an increase in the size of class from 110 to 175 and a change in classroom as well as instructor, the percentage of students who felt that the class was too large was reduced from 74 per cent to 47 per cent. It is believed that each of the three changes contributed to the lessening of student opposition to the large-size class.

12. I did not have enough chance to talk over examinations with my instructor (or counsellor).

Nonexperimental	First Semester	10	16	19	31	24		2	27	10	47	15
	Second Semester	7	13	16	39	26		8	6	15	37	34
Experimental	First Semester	23	25	18	19	15		19	17	15	34	14
	Second Semester	13	19	14	35	20		18	20	13	30	19

It is apparent that the greatest percentage of students agreeing that they did not have adequate opportunity to discuss their examinations with their instructors (or counsellors) is found in the experimental sections. Several factors may have contributed to this result. Most important perhaps is the tendency of students in the small lecture-discussion section to ask questions about their examinations in subsequent class sessions. Another factor is that the consultation schedule established for the experimental sections provided less flexibility in the consultation program than is available where the student is free to call upon his instructor at whatever time he may find the instructor in his office. It is likely also that some of the students in the experimental sections were scheduled for consultations at periods during the day which they considered inconvenient. An examination of individual student records shows that very few, if any, students in the experimental sections utilised fully their opportunities for consultation. It may be noted that a much smaller percentage of the Economics 11 experimental section felt that they did not have adequate opportunity to discuss examinations with their counsellors during the second semester than was true during the first semester.

13. I did not have enough opportunity to discuss in class.

Nonexperimental	First Semester	1	8	14	43	34	0	5	20	54	22
	Second Semester	4	13	11	41	31	4	14	5	45	34
Experimental	First Semester	42	23	15	11	10	32	23	24	16	4
	Second Semester	3	26	22	13	8	37	26	19	12	6

Since there was no provision for class discussion in the experimental sections, it is not surprising to find that the percentage of students who found inadequate opportunity for such discussion was greatest in the experimental sections. The noticeable increase in the percentage of students who found inadequate opportunities for discussion in the nonexperimental sections suggests a tendency on the part of the instructors in these sections to resort more to the lecture method of presentation. A similar result in the Economics 12 experimental section probably was due to the complete abandonment of class discussion which accompanied the increase in size of class and the change of instructors. The sharp decline in the Economics 11 experimental section in the percentage of students who found inadequate opportunity for class discussion may have resulted from the increased skill at presentation of the instructor or from a tendency of students who preferred this method of class organization to select this particular section. The opportunity to discuss in class in the principles course in economics apparently is not too important a consideration if other conditions are satisfactory.

14. I believe that more use could have been made of audio-visual aids.

Nonexperimental	Second Semester	14	33	30	16	7	15	32	27	18	7
Experimental	Second Semester	5	11	25	36	23	26	23	23	20	9

In three of the four groups, almost 50 per cent of the students felt that more use could have been made of audio-visual aids. This compares with only 16 per cent in the experimental section of Economics 11 who shared this view. Many of the staff members feel that the subject matter of Economics 12 is not well suited to the use of visual aids.

15. I believe that too much use was made of audio-visual aids.

Nonexperimental	Second Semester	0	1	26	38	36	2	1	24	34	40
Experimental	Second Semester	1	6	21	37	36	2	2	16	45	35

Since the nonexperimental sections did not utilise audio-visual aids, it is not surprising to find that practically no students felt that these aids were used excessively in their classes. It is surprising to find that in the experimental sections, in which visual aids were used extensively, practically no students felt that it was overdone. Students apparently consider audio-visual aids extremely effective in classroom instruction.

16. I believe that more written assignments should have been required.

Nonexperimental	Second Semester	11	26	11	31	20	7	17	15	45	15
Experimental	Second Semester	9	14	17	44	25	3	12	22	38	25

It is observed that a majority of the students in each of the groups indicated disagreement with the above statement. The percentage of students disagreeing with the statement was greatest in the experimental sections where a systematic program of written assignments was in operation. The extensive opposition to greater utilization of written assignments may have reflected a feeling that such exercises are ineffective educational devices or that the device was already adequately exploited. It may be significant that a substantial percentage of the students in the nonexperimental sections indicated approval of the suggestion that more written assignments be required.

17. I believe that too much written work was required.

Nonexperimental	Second Semester	1	2	19	53	26	0	5	17	63	15
Experimental	Second Semester	0	7	17	62	15	2	6	20	54	18

A comparison of student reaction to statements numbered 16 and 17 shows that the percentage of students feeling that written work was not overemphasized was only slightly greater than the percentage who believed that written work should not be given greater emphasis. In each case these students made up about two-thirds of each group. Apparently the emphasis upon written work was at the optimum point.

18. I believe that more outside reading should have been required.

Nonexperimental	Second Semester	2	8	13	45	33	1	5	7	43	44
Experimental	Second Semester	1	2	12	44	42	0	1	7	44	47

The overwhelming disagreement with the suggestion that more outside readings be required suggests that students do not regard outside readings as being particularly beneficial. The opposition to an expansion of the program of outside readings was somewhat more pronounced in the experimental than in the nonexperimental sections.

19. I believe that too much outside reading was required.

Nonexperimental	Second Semester	10	19	25	38	7	15	15	30	33	7
Experimental	Second Semester	16	18	22	35	10	19	30	21	25	5

Student reaction to this statement shows a somewhat higher percentage of approval in the experimental than in the nonexperimental sections. Although the response to statement number 18 showed overwhelming opposition to an expansion of outside reading assignments, a much smaller percentage of the students were willing to say that too much outside reading was being required. This reluctance to criticise may have been due to a feeling of incompetence to judge what is the appropriate volume of outside reading or to a feeling that the existing volume was appropriate.

20. I feel that the range of topics covered in this course is too extensive.

Nonexperimental	Second Semester	5	14	22	45	14	5	23	20	45	8
Experimental	Second Semester	4	12	18	48	18	7	22	25	34	13

In view of the almost universal criticism of principles of economics courses that they attempt to cover too much material, it is somewhat surprising to discover that a majority of the students in three of the four groups disagreed with this criticism. There was not significant difference in the distribution of student reactions between the nonexperimental and the experimental sections in either Economics 11 or Economics 12. However, the percentage of students agreeing with the statement was somewhat higher in Economics 12 than in Economics 11.

21. I feel that too much emphasis has been placed upon minor details.

Nonexperimental	Second Semester	12	17	16	45	12	8	24	19	40	9
Experimental	Second Semester	13	17	14	42	14	20	28	19	27	6

Except for the experimental section of Economics 12 where almost one-half of the students felt that minor details were overemphasized, the percentage of students taking this view made up less than one-third of the group. The situation in the Economics 12 experimental section was probably due to the limited experience of the instructor in teaching this course.

22. I feel that there has been a lack of coordination between the lectures, written assignments, and reading of papers.

Nonexperimental	Second Semester	7	16	19	39	19		10	25	19	31	14
Experimental	Second Semester	3	8	10	47	32		16	20	13	37	14

The least criticism involving coordination was expressed in the experimental section of Economics 11. Somewhat more criticism was indicated in the nonexperimental section of Economics 11. The greatest amount of criticism was voiced in the Economics 12 groups where slightly more than one-third of the class felt that they sensed a lack of coordination between the lectures, the written assignments, and the reading of papers.

23. We did not spend enough time reviewing tests and written work in class.

Nonexperimental	Second Semester	14	25	15	33	14		17	27	13	33	11
Experimental	Second Semester	25	35	14	17	9		35	39	12	8	6

The least amount of criticism of this character was shown for the nonexperimental sections. This of course would be expected since the function of the graduate assistant counsellors is to consult with students concerning any of their work including examinations. Students in the experimental sections did not take full advantage of their opportunities for consultation.

Statement relating to instruction.

24. My instructor knew his subject well.

Nonexperimental	First Semester	27	38	17	14	4		20	44	17	12	7
	Second Semester	59	31	6	4	1		31	53	11	5	1
Experimental	First Semester	92	6	0	1	1		46	38	12	3	2
	Second Semester	86	13	1	0	0		20	48	20	8	3

A very large majority of the students in each of the groups apparently felt that their instructors knew their subject well. The percentage of students expressing this opinion ranged from 68 per cent in the Economics 12 experimental section to 99 in the Economics 11 experimental section. On the basis of this analysis it is impossible to determine whether the nonexperimental or the experimental sections showed up best.

25. My instructor made the subject interesting.

Nonexperimental	First Semester	6	26	15	28	24		5	14	22	29	29
	Second Semester	43	20	10	13	14		5	24	18	34	19
Experimental	First Semester	45	47	6	2	1		4	24	13	39	20
	Second Semester	59	32	4	3	1		3	23	18	33	23

Student reactions indicate a wide variation in the extent to which instructors were successful in making the subject interesting. The instructor in the Economics 12 experimental section was the least successful while the instructor in the Economics 11 experimental section was the most successful. The percentages of students indicating that their instructors made the subject interesting in these two sections were 26 and 91 per cent, respectively. This is an enormous range. The percentages of students in the nonexperimental sections of Economics 11 and Economics 12 who felt that their instructors had made the subject interesting were 63 and 29 per cent, respectively. The difference between the two experimental sections probably are attributable in part at least to differences in teaching experience. Since the instructors in the nonexperimental sections of Economics 12 were more experienced than those in the nonexperimental sections of Economics 11, this explanation does not seem appropriate. Some members of the staff have expressed the opinion that the differences between Economics 11 and Economics 12, on this score, are due largely to differences in the nature of the subject matter covered in the two courses.

26. I feel that my instructor had a genuine interest in students.

Nonexperimental	First Semester	20	31	29	15	4		15	31	34	17	2
	Second Semester	43	29	8	11	8		22	38	20	15	5
Experimental	First Semester	40	35	22	1	2		10	31	38	13	9
	Second Semester	48	33	14	3	2		9	31	35	15	9

During the first semester, student reaction indicated that the instructors in the experimental sections had a greater genuine interest in students than the instructors in the nonexperimental sections of the same course. During the second semester, a very great improvement was made in the nonexperimental sections of Economics 11 so that student reaction in both groups of students in Economics 11 showed 75 per cent or more of the students felt that their instructors had a genuine interest in them. The situation deteriorated in both groups in Economics 12 with only 40 per cent of the students indicating approval of the above statement. It seems apparent that instructors of large sections are not necessarily handicapped because of the size of class in demonstrating a genuine interest in their students.

27. I feel that my instructor talked over the heads of a majority of the students.

Nonexperimental	Second Semester	7	22	10	40	20	4	15	25	45	12
Experimental	Second Semester	0	3	12	46	39	5	15	22	41	17

Only 3 per cent of the students in the experimental section of Economics 11 felt that their instructor talked over the heads of a majority of the students. 29 per cent of the students in the nonexperimental sections of this course concurred in this view. In both sections of Economics 12 approximately 20 per cent of the students felt that their instructor tended to talk over the heads of the majority of students. This weakness on the part of instructors apparently is not a function of class size.

28. My counsellor knew his subject well.

Experimental	Second Semester	11	29	53	6	3	11	33	35	12	8

Although students in the nonexperimental sections did not have graduate assistant counsellors assigned to them, 21 per cent of these students in Economics 11 and 59 per cent of those in Economics 12 checked this statement. However, most of them checked "U" indicating that they were undecided or neutral. The large percentage of students in the experimental sections who also checked "U" probably were students who did not avail themselves of the services of the counsellors. If this assumption is correct, it seems apparent that the great majority of students who accepted counselling services considered their counsellors to be competent.

29. My counsellor was effective in clarifying the matters that troubled me.

Experimental	Second Semester	8	27	52	7	6	14	24	34	18	10

From one-third to one-half of the students indicated that they were undecided or neutral concerning the effectiveness of their counsellors. This group probably included students who did not avail themselves of the counselling service as well as students who were truly undecided. Of those who took a positive position, the majority indicated that they felt that the counsellors were effective. A substantial percentage (28 per cent) of the Economics 12 students considered the counsellors ineffective. Since some counsellors were assigned to Economics 11 and others to Economics 12, it may be concluded that some of them were actually less effective than others.

30. My instructor made sufficient application of economics to actual life.

Nonexperimental	Second Semester	26	43	12	15	4	13	51	18	16	3
Experimental	Second Semester	37	46	11	3	1	8	49	22	13	8

Student reactions to the above statement indicate that instructors in all of the groups made sufficient application of economics to actual life. The experimental section of Economics 11 rated first with 85 per cent of the students satisfied on this score. The Economics 12 experimental section rated last with only 57 per cent of the students agreeing to the statement. The nonexperimental sections in Economics 11 and 12 received favorable ratings from 69 and 64 per cent, respectively, of their students. This suggests that specialised instruction as applied in this experiment does not necessarily impair the ability of an instructor to make his lectures realistic.

31. My instructor did not apportion the time in accordance with the difficulty of the topics covered.

Nonexperimental	Second Semester	10	17	17	36	19	14	27	15	36	7
Experimental	Second Semester	5	12	15	41	27	25	22	27	20	6

The instructors in Economics 11, in the view of the students, apparently did a better job of apportioning the time in accordance with the difficulty of the topics covered than the instructors in Economics 12. The instructor in the Economics 11 experimental section received the smallest percentage of critical reactions on this score while the instructor in the Economics 12 experimental section received the greatest percentage of critical reactions.

Statements relating to course content.

32. I feel that I learned to understand how our economy functions.

Nonexperimental	Second Semester	10	64	13	11	2	5	65	14	14	3
Experimental	Second Semester	14	72	9	4	1	8	69	15	5	3

Since it is one of the major objectives of the principles course to explain how our economy functions, student reaction to the above statement is of special interest. It will be seen that the experimental sections in both courses obtained a larger percentage of favorable reactions than the nonexperimental groups. It is interesting to note that a larger percentage of students in Economics 11 felt that they understood how the economy functions than was true of the students in Economics 12. It may be that the students in Economics 12 had developed a better appreciation of the complexities of the economy and, for this reason, were less sure that they understood its functioning.

33. I feel that I understand the terminology of economics.

Nonexperimental	Second Semester	7	60	19	12	2	4	61	21	12	2
Experimental	Second Semester	9	73	12	5	1	7	67	13	9	3

The experimental sections seemed to excell in the ability of the instructor to develop an understanding of the terminology of economics. The experimental and nonexperimental sections in Economics 11 drew 82 and 67 per cent, respectively, affirmative reactions from the students. In economics 12 experimental and nonexperimental sections, the affirmative responses were only 74 and 65 per cent, respectively.

Table 1. Percentage distribution of students according to cumulative grade average

Range of cumulative grade averages	Percentage distribution		Cumulative percentages	
	Experimental	Nonexperimental	Experimental	Nonexperimental
		Economics 11		
89.6 or more	2.6	2.7	2.6	2.7
87.1 - 89.5	5.3	6.4	7.9	9.1
84.6 - 87.0	7.9	11.8	15.8	20.9
82.1 - 84.5	6.6	10.9	22.4	31.8
79.6 - 82.0	13.8	11.8	36.2	43.6
77.1 - 79.5	13.2	14.5	49.4	58.1
74.6 - 77.0	23.0	20.0	72.0	78.1
72.5 - 74.5	13.2	11.8	85.2	89.9
Under 72.5	13.2	9.1	98.4	99.0
Unclassified	1.6	1.0	100.0	100.0
		Economics 12		
89.6 or more	4.3	5.7	4.3	5.7
87.6 - 89.5	3.2	2.9	7.5	8.6
84.6 - 87.0	5.4	8.3	12.9	16.9
82.1 - 84.5	2.2	5.7	15.1	22.6
79.6 - 82.0	20.4	8.3	35.5	30.9
77.1 - 79.5	12.9	14.3	48.4	45.2
74.6 - 77.0	20.4	37.1	68.8	82.3
72.5 - 74.5	20.4	14.3	89.2	96.6
Under 72.5	9.7	- -	98.9	96.6
Unclassified	1.1	3.4	100.0	100.0

Data abstracted from official University student records.

Table 2. Students' appraisal of their own understanding of major economic concepts and relationships

Economic concepts and relationships	Nonexperimental "Clear" (In percentages)	Nonexperimental "Confused" (In percentages)	Experimental "Clear" (In percentages)	Experimental "Confused" (In percentages)
Economics 11				
The law of scarcity	66%	34%	72%	28%
The economic problem and the 3 problems every economy must solve	91	9	94	6
Relative importance of federal, state, and local governmental expenditures and the principal taxes each uses to obtain revenues	77	23	80	20
Meaning of capital, specialization, and money and their relationship	53	47	63	37
Organization and structure of organized labor	64	36	46	54
Meaning of "net investment"	54	46	71	29
Two methods of computing GNP, NNP, NI, PI and DI	56	44	63	37
Consumption and saving schedules, meaning of MPC and MPS; cleavage between savings and investment	53	47	63	37
Multiplier	64	36	67	33
National income; equilibrium level	61	39	76	24
Meaning, causes and results of inflation and deflation; inflationary and deflationary gaps	67	37	65	35
Nature and functions of money; "near-monies"	85	15	88	12
How the individual banks and the banking system create money	86	14	85	15
How the Federal Reserve can control the money supply	84	16	86	14
How the money supply affects national income	69	31	71	29
Types of fiscal policy; the meaning and influence of the national debt	45	55	50	50
The basic factors affecting the business cycle	40	60	35	65
Economics 12				
The demand schedule	95	5	98	2
The law of diminishing demand	92	8	95	5
Elasticity	61	39	66	34
Equilibrium	87	13	89	11
Short-run	64	36	84	16
Normal price	35	65	43	57
Shifts of demand or supply	80	20	81	19
Monopolistic competition	77	23	79	21
Marginal cost and/or revenue	69	31	64	36
Fixed and variable costs	93	7	91	9
Diagrams pertaining to supply and demand	69	31	71	29
The least-cost combination	43	57	46	54
Derived demand	76	24	44	56
Diminishing returns	95	5	92	8
Factor pricing	40	60	33	67
Implicit and explicit returns	52	48	79	21
Rent and the marginal product	50	50	50	50
Equalizing differences in wages	51	49	36	64
Net productivity of capital	41	59	52	48
Capitalized value of an income	24	76	28	72
Foreign exchange rates	73	27	86	14
Balance of international payments	53	47	90	10
Theory of comparative advantage	76	24	70	30
Economic consequences of high tariffs	83	17	63	37
Absolute advantage	77	23	70	30
Marginal revenue product	62	38	55	45

Table 3. Student aptitude, final examination scores, and student attitudes; Second Semester

Range of aptitude scores	Number of students	Average examination score	Average attitude score with respect to: Total (165)	Instruction (40)	Content (10)	Organization (65)	General Impressions (25)	Examinations (25)
			Economics 11					
64 - 82	N 8	64	117	31	8	44	18	17
	E 7	64	123	31	8	46	19	19
83 - 101	N 23	61	114	29	7	46	16	17
	E 16	69	124	32	8	47	18	19
102- 120	N 46	66	113	27	7	45	16	17
	E 50	73	120	32	8	44	18	18
121- 139	N 48	70	113	27	7	45	16	17
	E 55	76	119	32	8	44	18	18
140- 158	N 28	73	115	27	7	47	16	18
	E 19	76	122	32	7	45	18	19
159- 178	N 9	76	119	26	7	49	18	18
	E 6	86	127	34	8	47	20	19
All students	N 163	67	115	28	7	46	16	17
	E 155	74	119	32	8	44	18	18
			Economics 12					
83 - 101	N 21	64	109	25	7	45	15	17
	E 23	62	111	26	7	43	17	18
102- 120	N 35	74	106	23	7	45	15	17
	E 45	67	100	23	7	37	14	18
121- 139	N 33	74	108	24	7	44	15	17
	E 61	70	111	26	8	42	16	18
140- 158	N 27	80	109	22	7	47	14	18
	E 21	74	106	24	7	40	16	18
All students	N 109	73	109	24	7	46	15	17
	E 160	68	107	25	7	41	16	18

Full column headings under "Average attitude score with respect to" are as follows: Total attitude score; attitude toward instruction; attitude toward content of course; attitude toward course organization; general impressions; and attitude toward course examinations. Maximum attitude scores attainable are shown in brackets at top of each column. Scores are computed by allowing 5 for the most favorable response, 1 for the least favorable, and 4, 3, and 2, respectively, for the intervening responses. Under "number of students", N refers to nonexperimental sections and E to the experimental section. The sum of the numbers shown under each designation will not equal the total shown for that designation because the brackets at the two extremes were omitted due to the small number of cases represented by each.

Table 4. Student status and average final examination scores; Second Semester

Cumulative credit hours	Number of Students	Average examination score	Average attitude score with respect to: Total (165)	Instruction (40)	Content (10)	Organization (65)	General Impressions (25)	Examinations (25)
			Economics 11					
10 - 19	N 5	70	116	26	8	47	18	18
	E 17	72	114	30	7	43	16	18
20 - 29	N 5	64	107	26	7	42	13	15
	E 10	64	123	33	8	44	19	19
30 - 39	N 20	67	119	31	7	46	17	18
	E 22	73	118	32	8	41	18	18
40 - 49	N 53	67	113	27	8	45	16	17
	E 49	75	122	32	8	45	18	19
50 - 59	N 15	69	109	29	7	43	14	17
	E 11	76	120	32	7	45	17	18
60 - 69	N 11	65	110	25	6	44	17	18
	E 3	76	132	36	9	52	16	19
70 - 79	N 21	68	124	30	8	51	16	19
	E 11	77	116	30	8	49	17	18
80 - 89	N 11	71	121	29	8	49	17	18
	E 9	80	121	33	8	43	20	18
Total	N 168	67	115	28	7	46	16	17
	E 155	74	119	32	8	44	18	18
			Economics 12					
40 - 49	N 34	73	109	23	8	46	15	17
	E 67	68	104	24	7	40	16	18
50 - 59	N 20	74	106	24	6	45	15	17
	E 25	71	108	26	8	40	17	17
60 - 69	N 10	72	100	21	7	42	13	17
	E 11	71	104	26	7	38	15	18
70 - 79	N 15	76	105	22	7	44	15	17
	E 22	63	104	25	7	39	14	18
80 - 89	N 12	77	128	27	9	53	17	21
	E 6	68	108	26	8	42	13	18
Unclassified	N 6	75	112	27	7	46	17	16
	E 11	70	96	22	7	35	15	17
Total	N 109	73	109	24	7	46	15	17
	E 160	68	107	25	7	41	16	18

For explanation of column headings etc., etc. see Table 3.

Table 5. College of matriculation, final examination scores, and student attitudes; 2nd Semester

College of matriculation		Number of students	Average examination score	Average attitude score with respect to: Total (165)	Instruction (40)	Content (10)	Organization (65)	General Impression (25)	Examination (25)
				Economics 11					
Agriculture	N	67	62	116	30	7	45	17	17
	E	8	78	130	33	8	50	20	19
Arts & Science	N	10	75	119	27	7	49	16	19
	E	13	75	103	28	6	38	16	15
Business Administration	N	29	72	114	26	7	47	16	18
	E	67	74	123	33	8	45	18	19
Engineering	N	47	72	113	27	7	46	16	17
	E	52	76	117	31	8	43	17	18
Teachers	N	7	71	113	24	8	48	16	18
	E	9	70	112	29	7	42	15	18
All students	N	168	67	115	28	7	46	16	17
	E	255	74	119	32	8	44	18	18
				Economics 12					
Agriculture	N	15	67	112	26	7	47	15	17
	E	1	64	113	29	8	43	21	12
Arts & Science	N	12	75	113	24	9	46	16	18
	E	8	65	119	30	8	45	16	19
Business Administration	N	61	74	107	23	7	45	15	17
	E	120	67	106	25	7	40	16	18
Engineering	N	16	77	111	24	8	47	15	17
	E	18	75	109	26	7	42	15	18
Teachers	N	4	64	105	24	6	48	11	18
	E	8	65	106	27	7	39	13	19
All students	N	109	72	109	24	7	46	15	17
	E	160	68	107	25	7	41	16	18

For explanation of column headings, etc., see Table 3.